Level of Service Ratings For Asset Management of BMPs

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Stormwater Practitioner’s Meeting
July 30, 2014
Washington, DC
Overview

- Asset Management Program
- Structural Stormwater Control Inventory
- Performance Measures
- Ties Back to NCDOT Mission and Goals
NCDOT Assets

NCDOT System

- 80,000 road miles
- >160,000 paved lane miles
- 13,500 bridges
- 88.1 M sf bridge deck area
- 8,900 signals
NCDOT Asset Management Program

Statutory Requirements: Biennial Report on Maintenance Condition and Costs

Conduct comprehensive statewide surveys

1. Maintenance Condition Survey
2. Bridge Condition Survey
3. Pavement Condition Survey

Establish Performance Standards

Outcomes with Targets: Bridge deck ratings in good condition; Pavement markings visible
<table>
<thead>
<tr>
<th>Roadway</th>
<th>PERFORMANCE MEASURE</th>
<th>2012 State Average</th>
<th>2012 State Average</th>
<th>2012 State Average</th>
<th>2012 State Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Element</td>
<td>Target</td>
<td>Score</td>
<td>Target</td>
<td>Score</td>
</tr>
<tr>
<td><strong>DRAINAGE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unpaved Shoulders</td>
<td>No dropoffs greater than 3 inches and no shoulders higher than 2 inches</td>
<td>95</td>
<td>92</td>
<td>90</td>
<td>92</td>
</tr>
<tr>
<td>Ditches (Lateral Ditches)</td>
<td>No blocked, eroded, or nonfunctioning ditches</td>
<td>95</td>
<td>99</td>
<td>90</td>
<td>97</td>
</tr>
<tr>
<td>Crossline Pipe (Blocked)</td>
<td>Greater than 50% diameter open</td>
<td>95</td>
<td>87</td>
<td>90</td>
<td>81</td>
</tr>
<tr>
<td>Crossline Pipe (Damaged)</td>
<td>No damage or structural deficiency effecting functionality</td>
<td>95</td>
<td>91</td>
<td>90</td>
<td>97</td>
</tr>
<tr>
<td>Curb &amp; Gutter (Blocked)</td>
<td>No obstruction greater than 2 inches for 2 feet</td>
<td>95</td>
<td>96</td>
<td>90</td>
<td>97</td>
</tr>
<tr>
<td>Boxes (Blocked or Damaged)</td>
<td>Grates and outlet pipes of boxes blocked &lt;50%. Inlets and outlets of boxes are not damaged, and grates are present and not broken.</td>
<td>95</td>
<td>84</td>
<td>90</td>
<td>90</td>
</tr>
</tbody>
</table>
| **ROADSIDE**                | Freeways: 45’ from travelway, 5’ behind guardrail, not blocking signs; Non-Freeways:  
|                             | Vertical clearance of 15’ over roadway and 10’ back of ditch centerline or shoulder point |                     |                   |                     |                   |                     |                   |                     |                   |
| Vegetation (Brush & Tree)   | Areas free of erosion                                                             | 90      | 92    | 85      | 90    | 80      | 86    |                     |                   |
| Vegetation (Turf Condition) |                                                                                   | 95      | 91    | 90      | 94    | 85      | 94    |                     |                   |
| Stormwater Devices (NPDES)  | Functioning as designed                                                            | 90      | 94    | 90      | 94    | 90      | 94    |                     |                   |
| Landscape Plant Beds        | Achieving a score of 2 or higher on the inspection form                           | 90      | 90    | 80      | 90    | N/A     | N/A   |                     |                   |
| Rest Areas & Welcome Centers| Condition Rating of 90                                                            | 90      | 96    | 90      | 93    | N/A     | N/A   |                     |                   |
| **TRAFFIC**                 | Present, visible                                                                  | 90      | 96    | 85      | 94    | 80      | 88    |                     |                   |
| Words and Symbols           | Present, visible                                                                  | N/A     | N/A   | 85      | 87    | 80      | 85    |                     |                   |
| Pavement Markers            | Present and reflective                                                            | 90      | 91    | 85      | 81    | N/A     | N/A   |                     |                   |
| Ground Mounted Signs        | Visible and legible                                                               | 90      | 94    | 85      | 94    | 85      | 89    |                     |                   |
| Overhead Signs              | Visible and legible                                                               | 92      | 99    | 85      | 97    | N/A     | N/A   |                     |                   |
| **BRIDGE**                  | Condition Rating >= 6                                                             | 85      | 86    | 80      | 87    | 75      | 89    |                     |                   |
| NBIS Culverts               | Condition Rating = Good                                                            | 80      | 81    | 70      | 72    | 60      | 56    |                     |                   |
| Non-NBIS Culverts           |                                                                                   | 95      | 88    | 92      | 93    | 92      | 84    |                     |                   |
| Overhead Sign Structures    |                                                                                   |                     |                   |                     |                   |                     |                   |                     |                   |
| **Totals**                  |                                                                                   | 91.27   | 91.43 | 86.16   | 90.27 | 82.16   | 87.43 |                     |                   |

Red – More than 10% below the target; Yellow – Within 10% of the target; Green – Met or exceeded target; Gray – Element was not rated

Table 5—Summary of Roadway Performance Condition Scores with 100 Being the Highest Score on a 0 to 100 Scale.
NPDES Permit Requirements

Beginning in 2005 with Second Term Permit

- Evaluate new BMP inspection and maintenance needs (create stormwater control inventory and conduct assessments)
- Develop a BMP Inspection and Maintenance Manual
- Develop and implement a BMP Inspection and Maintenance Program
- Submit BMP Inspection and Maintenance information to NCDENR for review
Devices & Locations

Types

- Bioretention Basin
- Filtration Basin
- Infiltration Basin
- Dry Detention Basin
- Wet Detention Basin
- Hazardous Spill Basin
- Stormwater Wetland
- Swale
- Level Spreader
- Preformed Scour Hole

Locations

- Existing rights-of-way
- Interchanges and ramps
- Bridges
- Rest areas
- Industrial facilities
- Weigh stations
Statewide BMP Inspection & Maintenance Program - Website

Stormwater Control Management System

- GIS – Web-based Tool
- Inventory Stormwater Controls (BMPs)
- Integrate Site Specific Information
- Accessible by NCDOT Staff, Consultants, Contractors
Stormwater Control Management System (SCMS)

Division Summary
Stormwater Control Management System (SCMS)

Individual BMP
Stormwater Control Management System (SCMS)

Location Map
Stormwater Control Management System (SCMS)

Inspection Report

Observations/Comments:
Device in very good condition; well maintained. Some sediment noted in forebay – suggest removing sediment as soon as possible to regain storage capacity.
Stormwater Control Management System (SCMS)

BMP Photos
Stormwater Control Inventory

- Bioretention (21)
- Infiltration Basin (75)
- Dry Detention Basin (75)
- Level Spreader (105)
- Wet Detention Basin (14)
- Pet Waste Stations (157)

- Filtration Basin (28)
- Stormwater Wetland (24)
- Hazardous Spill Basin (191)
- Swale (199)
- Others (121)

Updated February 2014
Stormwater Control Inspection and Maintenance Manual

Completed in 2009
Provides Guidance on:
- Inspection
- Reporting and Record Keeping
- Chapters on Control Devices
- Inspection Forms

http://www.ncdot.gov/doh/operations/dp_chief_eng/roadside/envoperations/other_links/
Performance Measures
Level of Service Rankings (LOS)

LOS A  Some aging and wear but no major deficiencies
LOS B  Minor structural deterioration and maintenance needs identified
LOS C  Moderate structural deterioration and maintenance needs identified but is still functioning properly
LOS D  Serious deterioration in at least one structural item and major maintenance needs identified. Function is inadequate
LOS F  Device has general or complete failure
Maintenance Needs Identified During 2014 Assessment Inspections

- Maintenance needs were found to be more routine in nature
- Problems associated with maintenance and not structural
- Maintenance needs found:
  - Maintenance of grasses, trees, shrubs and other desirable vegetation (mowing, pruning, etc.)
  - Removal of unwanted plant species
  - Removal of trash and debris (functionality/aesthetics)
  - Upkeep of mechanical components (ex. - grease gate)
Maintenance Needs Increase with Time

New

1 to 2 years

3 to 5 years
Level of Service

• What’s the value of LOS Ratings?
  - Compliance
  - Accountability
  - Asset Management
  - Data Driven Decisions
  - Resource Prioritization
## Highway Performance Profile: Infrastructure Health Condition Scores

<table>
<thead>
<tr>
<th>Division</th>
<th>2012 Pavement Conditions *</th>
<th>2013 Bridge Conditions</th>
<th>2012* Roadside Features Index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Statewide Tier</td>
<td>Regional Tier</td>
<td>Subregional Tier</td>
</tr>
<tr>
<td>Color Legend</td>
<td>(70-85%=yellow)</td>
<td>(65-80%=yellow)</td>
<td>(60-75%=yellow)</td>
</tr>
<tr>
<td>1</td>
<td>58.7%</td>
<td>65.3%</td>
<td>63.7%</td>
</tr>
<tr>
<td>2</td>
<td>81.8%</td>
<td>54.5%</td>
<td>68.5%</td>
</tr>
<tr>
<td>3</td>
<td>71.8%</td>
<td>54.9%</td>
<td>76.5%</td>
</tr>
<tr>
<td>4</td>
<td>82.8%</td>
<td>71.1%</td>
<td>67.1%</td>
</tr>
<tr>
<td>5</td>
<td>81.0%</td>
<td>65.5%</td>
<td>83.1%</td>
</tr>
<tr>
<td>6</td>
<td>74.1%</td>
<td>68.8%</td>
<td>74.6%</td>
</tr>
<tr>
<td>7</td>
<td>72.9%</td>
<td>77.4%</td>
<td>68.9%</td>
</tr>
<tr>
<td>8</td>
<td>61.2%</td>
<td>59.3%</td>
<td>68.3%</td>
</tr>
<tr>
<td>9</td>
<td>77.0%</td>
<td>61.0%</td>
<td>64.0%</td>
</tr>
<tr>
<td>10</td>
<td>71.6%</td>
<td>61.5%</td>
<td>68.2%</td>
</tr>
<tr>
<td>11</td>
<td>87.9%</td>
<td>78.0%</td>
<td>69.8%</td>
</tr>
<tr>
<td>12</td>
<td>68.0%</td>
<td>60.1%</td>
<td>60.3%</td>
</tr>
<tr>
<td><strong>Statewide</strong></td>
<td><strong>73.5%</strong></td>
<td><strong>62.5%</strong></td>
<td><strong>69.3%</strong></td>
</tr>
</tbody>
</table>

**Notes:**
- Pavement Conditions and Roadside Features are currently produced biennially. These conditions will be reevaluated in 2014.
- Pavement Condition is defined as the percentage of pavement miles in good condition.
- Bridge Condition is defined as the percentage of bridges in good condition.
- Roadside Features is defined as a composite score from 1–100 with 100 being the best.
- For counties included in each division, please see map on page 9.
Accountability

Mission & Goals

Mission:
Connecting people and places safely and efficiently, with accountability and environmental sensitivity to enhance the economy, health and well-being of North Carolina.

Goals:
- Make our transportation network safer.
- Make our transportation network move people and goods more efficiently.
- Make our infrastructure last longer.
- Make our organization a place that works well.
- Make our organization a great place to work.
Questions?